

Abstract

A material to reduce the effects of trauma received from the impact of a projectile. One embodiment is a needle-punched, non-woven material including at least one type of ballistic fibers selected and oriented to provide a cushioning effect and maintain a high compressive restitution constant. A percentage of the fibers are oriented with at least their ends lying approximately perpendicular to the fabric plane and/or oriented to lie in a waveform generally along or parallel to the fabric plane. This enables the ends of the fibers lying perpendicular to the fabric plane to cushion the impact from the projectile by dissipating energy through compressional resistance, and the fibers along the fabric plane to reduce energy through dispersal along fiber lines, thereby reducing the trauma resulting from an impact.